Remarks

Applicants thank the Examiner for examining the present application and finding that claim 8 contains allowable subject matter. With entry of this amendment, claims 1-31 will remain pending. As more fully discussed below, all of the Examiner's rejections are traversed and reconsideration of the claims is requested in view of the following remarks.

Claims 1-7

Keller Does Not Teach All the Elements of Independent Claim 1 as Arranged in the Claim

The Examiner rejects independent claim 1 as being anticipated under 35 U.S.C. § 102(b) by Keller et al., "Privacy Algorithm for Cylindrical Holographic Weapons Surveillance System." ("*Keller*") (Office action at pgs. 2-3.) In particular, the Examiner suggests that "it is clear that *Keller* teaches using a processing system that includes the neural network, and it is clear that *Keller* teaches 360° image depth information 'data'; therefore, it is inherent that the neural network must 'inherent' [sic] include the two inputs for the image 'intensity,' and the range 'depth' to distinguish between skin and other features as explained in page 2 [of *Keller*]." (Office action at pg. 3.) The Examiner's rejection is traversed.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." (MPEP 2131.) Furthermore, "the elements must be arranged as required by the claim." (Id.)

Further, with respect to inherency, "[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic." (MPEP 2112.IV.) "In relying on the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic <u>necessarily</u> flows from the teachings of the applied prior art." (Id.)

As discussed below, *Keller* does not expressly or inherently teach each element of claim 1 arranged as required by the claim.

Claim 1 recites a method comprising:

> detecting electromagnetic radiation returned from a concealed surface associated with a person, the electromagnetic radiation including one or more frequencies in a range of about 200 MHz to about 1 THz;
>
> establishing data corresponding to intensity of the returned electromagnetic radiation along the surface and depth along the surface; and
>
> adaptively processing the data to determine if a man-made object suspected to be one or more of contraband or a potential security threat is being carried by the person as a function of the intensity along the surface and the depth along the surface.

Keller describes research and development efforts concerning a privacy algorithm that removes human features from images produced by a millimeter-wave surveillance system. (*Keller* at pg. 1). In the section of *Keller* relied on by the Examiner, *Keller* explains:

> A new three-dimensional (3-D) combined holographic algorithm has been developed. It uses cylindrical holographic imaging techniques similar to CHIS except that this new technique forms 3-D volumetric imagery that provides high-resolution depth information. One reason for the success of this imaging technique is that the system uses a very wide-band transceiver to obtain very high depth resolution. With this reconstruction algorithm, edge and gradient detection algorithms can effectively be applied to the imagery to remove human features such as 'skin' yet still retain the outline of the concealed objects.

(*Keller* at pg. 2.)

Figures 1(b) and 1(d) of *Keller* show the results of one edge detection algorithm. The caption for Figures 1(b) and 1(d) note that the results are "morphological edge detection results."

There is no indication on page 2 of *Keller* that the processing performed determines if a man-made object suspected to be one or more of contraband or a potential security threat is being carried by the person "as a function of the intensity along the surface and the depth along the surface." Specifically, there is no indication in *Keller* that both the "intensity along the surface" and the "depth along the surface" are necessarily used in producing the edge detection results shown in FIGS. 1(b) and 1(d). Instead, *Keller* is silent as to the specifics of the edge and gradient detection algorithms.

Furthermore, the Examiner has not provided any rationale or evidence tending to show "that the missing descriptive matter is necessarily present in the thing described in the reference" in order to establish inherency. MPEP 2112.IV (citing *in re Robertson*, 169 F.3d 743, 745, 49 USPQ2d, 19149, 1950-51 (Fed. Cir. 1999)). Instead, the Examiner appears to conclude (without any rationale or evidence) that: (1) the edge and gradient algorithm on page 2 uses depth data;

and (2) because intensity data is created as part of producing the image data, the intensity data must also be an input to the edge and gradient algorithms discussed on page 2 "to distinguish between skin and other features." (Office action at pgs. 2-3).

However, the Examiner has not shown why the edge and gradient algorithms cannot use intensity information alone or depth information alone.

Furthermore, the neural networks referenced in *Keller* also do not indicate that they can determine if a man-made object suspected to be one or more of contraband or a potential security threat is being carried by the person as a function of "the intensity along the surface and the depth along the surface." In particular, the *Keller* article refers to three types or uses of neural networks: (1) a multi-layer perceptron artificial neural network (ANN) used to detect plastic textures; (2) a pulse coupled neural network (PCNN) used to detect any man-made objects; and (3) an artificial neural network trained on spatial frequencies to detect any man-made object. (Keller at pgs. 2-3.) As more fully explained below, none of the neural networks (1) through (3) involves using both intensity data and depth data to determine the presence of a man-made object.

First, *Keller* refers to a "multi-layer perceptron artificial neural network (ANN) [to detect plastic texture in holographic imagery that] was developed and trained with the backpropagation of error algorithm on images with plastic objects." (*Keller* at pg. 3.) This neural network, however, is used for detecting a "speckled texture on [plastic, ceramic, and other dielectric items] attributable to wave interference of the reflected and transmitted waves." (*Keller* at pg. 2.) There is no indication in *Keller* that the first neural network detects a speckled texture "as a function of the intensity along the surface and the depth along the surface" as required by claim 1. Indeed, there is no mention or indication in *Keller* that this first neural network uses "depth" information at all.

Second, *Keller* mentions a "Pulse Couple Neural Network (PCNN)" and states that "[a] PCNN is a visual cortex model sometimes useful for object segmentation and edge detection." (*Keller* at pg. 3.) The reference to object segmentation or edge detection, however, does not indicate that the object or edge is determined "as a function of the intensity along the surface and the depth along the surface" as required by claim 1. Indeed, there is no indication that such segmentation and detection uses both intensity data and depth data, or cannot be performed using only one type of data.

Third, *Keller* mentions an approach that "uses an artificial neural network trained on the spatial frequencies of image segments to identify possible areas on the image containing man-made structures." There is no indication in *Keller* that the third neural network detects a man-made structures "as a function of the intensity along the surface and the depth along the surface" as required by claim 1. Indeed, there is no mention or indication in *Keller* that this third neural network uses "depth" information at all.

In addition to not teaching all of the elements of claim 1, there is also no teaching in *Keller* of combining any of the neural networks with the methods of page 2 to form a single method arranged as in claim 1. Thus, *Keller* does not show the elements as arranged in the claim as required by MPEP 2131.

Accordingly, *Keller* fails to teach or suggest all the features of claim 1 as arranged in the claim. The Examiner's § 102(b) rejection of independent claim 1 should therefore be withdrawn and such action is respectfully requested.

Keller Does Not Enable All the Elements of Independent Claim 1

The sections in *Keller* relied on by the Examiner do not provide sufficient disclosure for one of ordinary skill in the art to practice the described methods. For example, with respect to the second neural network technique described, *Keller* provides no further implementation detail than that reproduced above and expressly states: "The initial implementation of the PCNN technique was not successful and additional development and understanding of the technique is required before it can be considered successful." With respect to the third neural network technique, *Keller* also provides no further implementation detail than that reproduced above and states: "This work is ongoing and has not been fully proven."

Accordingly, *Keller* is not an enabling disclosure for the techniques relied on by the Examiner. The Examiner's § 102(b) rejection of independent claim 1 should be withdrawn for this additional reason as well. *See Novo Nordisk Pharm. v. Bio-Technology General*, 424 F.3d 1347 (Fed. Cir. 2005) ("In order to anticipate, a prior art disclosure must also be enabling, such that one of ordinary skill in the art could practice the invention without undue experimentation.")

Dependent Claims 2-7 Are Also Allowable Over *Keller*

The Examiner rejects dependent claims 2 and 4-7 as being anticipated by *Keller*. (Office action at pgs. 2-3.) The Examiner also rejects claim 3 as being obvious over *Keller* in view of U.S. Patent Application Publication No. 20020150304 ("*Ockman*"). The Examiner's rejections are all traversed.

Claims 2-7 are dependent on independent claim 1 and are allowable for at least the reasons stated above with respect to claim 1. Further, claims 2-7 are each independently patentable because of the unique and nonobvious features of the combinations set forth in each claim.

Claims 9-16

Keller Does Not Teach All the Elements of Independent Claim 9 As Arranged in the Claim

The Examiner rejects independent claim 9 as being anticipated under 35 U.S.C. § 102(b) by *Keller*. (Office action at pgs. 2-3.) As with claim 1, the Examiner suggests that "it is clear that *Keller* teaches using a processing system that includes the neural network, and it is clear that *Keller* teaches 360° image depth information 'data'; therefore, it is inherent that the neural network must 'inherent' [sic] include the two inputs for the image 'intensity,' and the range 'depth' to distinguish between skin and other features as explained in page 2 [of *Keller*]." (Office action at pg. 3.) The Examiner's rejection is traversed.

As discussed below, *Keller* does not expressly or inherently teach each element of claim 9 arranged as required by the claim.

Independent claim 9 recites a method comprising:

> irradiating an interrogation region including a person carrying a concealed object;
>
> detecting electromagnetic radiation returned from the interrogation region in response to said irradiating, the electromagnetic radiation including one or more frequencies in a range of about 200 MHz to about 1 THz;
>
> establishing data representative of a map of intensity of the electromagnetic radiation returned from the interrogation region and a map of depth along the interrogation region; and
>
> inputting the data into a neural network to determine if the concealed object is at least one of contraband or a weapon based on the map of intensity and the map of depth.

Keller describes research and development efforts concerning a privacy algorithm that removes human features from images produced by a millimeter-wave surveillance system. (*Keller* at pg. 1). In the section of *Keller* relied on by the Examiner, *Keller* reports results for edge and gradient detection algorithms applied to imagery. (*Keller* at pg. 2.) Figures 1(b) and 1(d) of *Keller* show the results of one edge detection algorithm.

There is no indication on page 2 of *Keller* that the processing performed involves "inputting the data into a neural network to determine if the concealed object is at least one of contraband or a weapon based on the map of intensity <u>and</u> the map of depth." Specifically, there is no indication in *Keller* that a "map of intensity" <u>and</u> a "map of depth" are necessarily used in producing the edge detection results shown in FIGS. 1(b) and 1(d). Instead, *Keller* is silent as to the specifics of the edge and gradient detection algorithms.

Furthermore, the Examiner has not provided any rationale or evidence tending to show "that the missing descriptive matter is necessarily present in the thing described in the reference" in order to establish inherency." MPEP 2112.IV (citing *in re Robertson*, 169 F.3d 743, 745, 49 USPQ2d, 19149, 1950-51 (Fed. Cir. 1999)). Instead, the Examiner appears to conclude (without any rationale or evidence) that: (1) the edge and gradient algorithm on page 2 uses depth data; and (2) because intensity data is created as part of producing the image data, the intensity data must also be an input to the edge and gradient algorithms discussed on page 2 "to distinguish between skin and other features." (Office action at pgs. 2-3).

However, the Examiner has not shown why the edge and gradient algorithms cannot use intensity information alone or depth information alone.

Furthermore, the neural networks referenced in *Keller* also do not indicate that they can input "data representative of a map of intensity of the electromagnetic radiation returned from the interrogation region <u>and</u> a map of depth along the interrogation region . . . to determine if the concealed object is at least one of contraband or a weapon based on the map of intensity <u>and</u> the map of depth." In particular, the *Keller* article refers to three types or uses of neural networks: (1) a multi-layer perceptron artificial neural network (ANN) used to detect plastic textures; (2) a pulse coupled neural network (PCNN) used to detect any man-made objects; and (3) an artificial neural network trained on spatial frequencies to detect any man-made object. As more fully explained above with respect to claim 1, none of the neural networks (1) through (3) described in

the *Keller* article, however, teaches or suggests using both a map of intensity and a map of depth to determine the presence of a man-made object.

In addition to not teaching all of the elements of claim 9, there is also no teaching in *Keller* of combining any of the neural networks with the methods of page 2 to form a single method arranged as in claim 9. Thus, *Keller* does not show the elements as arranged in the claim as required by MPEP 2131.

Accordingly, *Keller* fails to teach or suggest all the features of claim 9 as arranged in the claim. The Examiner's § 102(b) rejection of independent claim 9 should therefore be withdrawn and such action is respectfully requested.

Keller Does Not Enable All the Elements of Independent Claim 9

The sections in *Keller* relied on by the Examiner do not provide sufficient disclosure for one of ordinary skill in the art to practice the described methods. For example, with respect to the second neural network technique described, *Keller* provides no further implementation detail than that reproduced above and expressly states: "The initial implementation of the PCNN technique was not successful and additional development and understanding of the technique is required before it can be considered successful." With respect to the third neural network technique, *Keller* also provides no further implementation detail than that reproduced above and states: "This work is ongoing and has not been fully proven."

Accordingly, *Keller* is not an enabling disclosure for the techniques relied on by the Examiner. The Examiner's § 102(b) rejection of independent claim 9 should be withdrawn for this additional reason as well. *See Novo Nordisk Pharm. v. Bio-Technology General*, 424 F.3d 1347 (Fed. Cir. 2005) ("In order to anticipate, a prior art disclosure must also be enabling, such that one of ordinary skill in the art could practice the invention without undue experimentation.")

Dependent Claims 10-16 Are Also Allowable

The Examiner rejects claims 10-16 as being anticipated by *Keller*. (Office action at pgs. 2-3.) These rejections are traversed.

Claims 10-16 are dependent on independent claim 9 and are allowable for at least the reasons stated above with respect to claim 9. Further, claims 10-16 are each independently

patentable because of the novel and nonobvious features of the combinations set forth in each claim.

Claims 17-24

Keller Does Not Teach All the Elements of Independent Claim 17 As Arranged in the Claim

The Examiner rejects independent claim 17 as being anticipated under 35 U.S.C. § 102(b) by *Keller*. (Office action at pgs. 2-3.) As with claim 1, the Examiner suggests that "it is clear that *Keller* teaches using a processing system that includes the neural network, and it is clear that *Keller* teaches 360° image depth information 'data'; therefore, it is inherent that the neural network must 'inherent' [sic] include the two inputs for the image 'intensity,' and the range 'depth' to distinguish between skin and other features as explained in page 2 [of *Keller*]." (Office action at pg. 3.) The Examiner's rejection is traversed.

As discussed below, *Keller* does not expressly or inherently teach each element of claim 17 arranged as required by the claim.

Independent claim 17 recites a system comprising:

> an array operable to interrogate a person with electromagnetic radiation at one or more frequencies in a range of about 200 MHz to about 1 THz; and
>
> a processing subsystem coupled to the array, the processing subsystem being operable to provide a neural network including a first set of inputs and a second set of inputs, the first set of inputs being arranged to receive data corresponding to a map of returned electromagnetic radiation intensity along a surface beneath clothing of the person, the second set of inputs being arranged to receive other data corresponding to a map of depth along the surface, the neural network being effective to evaluate if one or more objects suspected of being at least one of contraband or a potential security threat as a function of the map of intensity and the map of depth are concealed by the person and provide one or more corresponding outputs.

Keller describes research and development efforts concerning a privacy algorithm that removes human features from images produced by a millimeter-wave surveillance system. (*Keller* at pg. 1). In the section of *Keller* relied on mainly by the Examiner, *Keller* reports results for edge and gradient detection algorithms applied to imagery. (*Keller* at pg. 2.) Figures 1(b) and 1(d) of *Keller* show the results of one edge detection algorithm.

There is no indication on page 2 of *Keller* that the processing performed involves "[a] first set of inputs being arranged to receive data corresponding to a map of returned electromagnetic radiation intensity along a surface beneath clothing of the person, [and a] second set of inputs being arranged to receive other data corresponding to a map of depth along the surface" or "evaluat[ing] if one or more objects suspected of being at least one of contraband or a potential security threat as a function of the map of intensity and the map of depth are concealed by the person." Specifically, there is no indication in *Keller* that a "map of intensity" and a "map of depth" are necessarily used in producing the edge detection results shown in FIGS. 1(b) and 1(d). Instead, *Keller* is silent as to the specifics of the edge and gradient detection algorithms.

Furthermore, the Examiner has not provided any rationale or evidence tending to show "that the missing descriptive matter is necessarily present in the thing described in the reference" in order to establish inherency. MPEP 2112.IV (citing *in re Robertson*, 169 F.3d 743, 745, 49 USPQ2d, 19149, 1950-51 (Fed. Cir. 1999)). Instead, the Examiner appears to conclude (without any rationale or evidence) that: (1) the edge and gradient algorithm on page 2 uses depth data; and (2) because intensity data is created as part of producing the image data, the intensity data must also be an input to the edge and gradient algorithms discussed on page 2 "to distinguish between skin and other features." (Office action at pgs. 2-3).

However, the Examiner has not shown why the edge and gradient algorithms cannot use intensity information or depth information alone.

Furthermore, the neural networks referenced in *Keller* also do not indicate that they have "[a] first set of inputs being arranged to receive data corresponding to a map of returned electromagnetic radiation intensity along a surface beneath clothing of the person, [and a] second set of inputs being arranged to receive other data corresponding to a map of depth along the surface" or can "evaluate if one or more objects suspected of being at least one of contraband or a potential security threat as a function of the map of intensity and the map of depth are concealed by the person." In particular, the *Keller* article refers to three types or uses of neural networks: (1) a multi-layer perceptron artificial neural network (ANN) used to detect plastic textures; (2) a pulse coupled neural network (PCNN) used to detect any man-made objects; and (3) an artificial neural network trained on spatial frequencies to detect any man-made object. As more fully explained above with respect to claim 1, none of the neural networks (1) through (3)

described in the *Keller* article, however, teaches or suggests using both a map of intensity and a map of depth to determine the presence of a man-made object.

In addition to not teaching all of the elements of claim 17, there is also no teaching in *Keller* of combining any of the neural networks with the methods of page 2 to form a single method arranged as in claim 17. Thus, *Keller* does not show the elements as arranged in the claim as required by MPEP 2131.

Accordingly, *Keller* fails to teach or suggest all the features of claim 17 as arranged in the claim. The Examiner's § 102(b) rejection of independent claim 17 should therefore be withdrawn and such action is respectfully requested.

Keller Does Not Enable All the Elements of Independent Claim 17

The sections in *Keller* relied on by the Examiner do not provide sufficient disclosure for one of ordinary skill in the art to practice the described methods. For example, with respect to the second neural network technique described, *Keller* provides no further implementation detail than that reproduced above and expressly states: "The initial implementation of the PCNN technique was not successful and additional development and understanding of the technique is required before it can be considered successful." With respect to the third neural network technique, *Keller* also provides no further implementation detail than that reproduced above and states: "This work is ongoing and has not been fully proven."

Accordingly, *Keller* is not an enabling disclosure for the techniques relied on by the Examiner. The Examiner's § 102(b) rejection of independent claim 17 should be withdrawn for this additional reason as well. *See Novo Nordisk Pharm. v. Bio-Technology General*, 424 F.3d 1347 (Fed. Cir. 2005) ("In order to anticipate, a prior art disclosure must also be enabling, such that one of ordinary skill in the art could practice the invention without undue experimentation.")

Dependent Claims 18-24 Are Also Allowable

The Examiner rejects claims 18-21 and 24 as being anticipated by *Keller*. (Office action at pgs. 5-6.) The Examiner also rejects claims 22-23 as being obvious over *Keller* in view of U.S. Patent No. 6,057,761 ("*Yukl*"). (Office action at pg. 7.) These rejections are traversed.

Claims 18-24 are dependent on independent claim 17 and are allowable for at least the reasons stated above with respect to claim 17. Further, claims 18-24 are each independently patentable because of the novel and nonobvious combinations of features set forth in each claim.

Claims 25-30

***Keller* Does Not Teach All the Elements of Independent Claim 25 As Arranged in the Claim**

The Examiner rejects independent claim 25 as being anticipated under 35 U.S.C. § 102(b) by *Keller*. (Office action at pgs. 2-3.) As with claim 1, the Examiner suggests that "it is clear that *Keller* teaches using a processing system that includes the neural network, and it is clear that *Keller* teaches 360° image depth information 'data'; therefore, it is inherent that the neural network must 'inherent' [sic] include the two inputs for the image 'intensity,' and the range 'depth' to distinguish between skin and other features as explained in page 2 [of *Keller*]." (Office action at pg. 3.) The Examiner's rejection is traversed.

As discussed below, *Keller* does not expressly or inherently teach each element of claim 25 arranged as required by the claim.

Independent claim 25 recites an apparatus comprising:

> a device carrying logic executable by one or more processors to analyze data corresponding to an image of a person obtained from electromagnetic radiation including one or more frequencies in a range of about 200 MHz to about 1 THz, the data being representative of a map of electromagnetic radiation intensity and a map of depth determined relative to the person, the logic being further operable to execute an adaptive process with the data to evaluate if one or more objects suspected of being at least one of contraband or a potential security threat are being concealed by the person as a function of the map of electromagnetic radiation intensity and the map of depth and provide an output indicating the detection of the one or more objects if indicated by the adaptive process.

Keller describes research and development efforts concerning a privacy algorithm that removes human features from images produced by a millimeter-wave surveillance system. (*Keller* at pg. 1). In the section of *Keller* relied on mainly by the Examiner, *Keller* reports results for edge and gradient detection algorithms applied to imagery. (*Keller* at pg. 2.) Figures 1(b) and 1(d) of *Keller* show the results of one edge detection algorithm.

There is no indication on page 2 of *Keller* that the processing performed involves "data being representative of a map of electromagnetic radiation intensity <u>and</u> a map of depth determined relative to the person" or executing "an adaptive process with the data to evaluate if one or more objects suspected of being at least one of contraband or a potential security threat are being concealed by the person as a function of the map of electromagnetic radiation intensity <u>and</u> the map of depth" Specifically, there is no indication in *Keller* that a "map of electromagnetic radiation intensity" <u>and</u> a "map of depth" are necessarily used in producing the edge detection results shown in FIGS. 1(b) and 1(d). Instead, *Keller* is silent as to the specifics of the edge and gradient detection algorithms.

Furthermore, the Examiner has not provided any rationale or evidence tending to show "that the missing descriptive matter is necessarily present in the thing described in the reference" in order to establish inherency. MPEP 2112.IV (citing *in re Robertson*, 169 F.3d 743, 745, 49 USPQ2d, 19149, 1950-51 (Fed. Cir. 1999)). Instead, the Examiner appears to conclude (without any rationale or evidence) that: (1) the edge and gradient algorithm on page 2 uses depth data; and (2) because intensity data is created as part of producing the image data, the intensity data must also be an input to the edge and gradient algorithms discussed on page 2 "to distinguish between skin and other features." (Office action at pgs. 2-3).

However, the Examiner has not shown why the edge and gradient algorithms cannot use intensity information or depth information alone.

Furthermore, the neural networks referenced in *Keller* also do not indicate that they can "execute an adaptive process with the data to evaluate if one or more objects suspected of being at least one of contraband or a potential security threat are being concealed by the person as a function of the map of electromagnetic radiation intensity and the map of depth." In particular, the *Keller* article refers to three types or uses of neural networks: (1) a multi-layer perceptron artificial neural network (ANN) used to detect plastic textures; (2) a pulse coupled neural network (PCNN) used to detect any man-made objects; and (3) an artificial neural network trained on spatial frequencies to detect any man-made object. As more fully explained above with respect to claim 1, none of the neural networks (1) through (3) described in the *Keller* article, however, teaches or suggests using <u>both</u> a map of electromagnetic radiation intensity <u>and</u> a map of depth to determine the presence of a man-made object.

In addition to not teaching all of the elements of claim 25, there is also no teaching in *Keller* of combining any of the neural networks with the methods of page 2 to form a single method arranged as in claim 25. Thus, *Keller* does not show the elements as arranged in the claim as required by MPEP 2131.

Accordingly, *Keller* fails to teach or suggest all the features of claim 25 as arranged in the claim. The Examiner's § 102(b) rejection of independent claim 25 should therefore be withdrawn and such action is respectfully requested.

Keller Does Not Enable All the Elements of Independent Claim 25

The sections in *Keller* relied on by the Examiner do not provide sufficient disclosure for one of ordinary skill in the art to practice the described methods. For example, with respect to the second neural network technique described, *Keller* provides no further implementation detail than that reproduced above and expressly states: "The initial implementation of the PCNN technique was not successful and additional development and understanding of the technique is required before it can be considered successful." With respect to the third neural network technique, *Keller* also provides no further implementation detail than that reproduced above and states: "This work is ongoing and has not been fully proven."

Accordingly, *Keller* is not an enabling disclosure for the techniques relied on by the Examiner. The Examiner's § 102(b) rejection of independent claim 25 should be withdrawn for this additional reason as well. *See* Novo *Nordisk Pharm. v. Bio-Technology General*, 424 F.3d 1347 (Fed. Cir. 2005) ("In order to anticipate, a prior art disclosure must also be enabling, such that one of ordinary skill in the art could practice the invention without undue experimentation.")

Dependent Claims 26-30 Are Also Allowable

The Examiner rejects claims 26 and 28-30 as being anticipated by *Keller*. (Office action at pgs. 2 and 3.) The Examiner also rejects claim 27 as being obvious over *Keller*. These rejections are traversed.

Claims 26-30 are dependent on independent claim 25 and are allowable for at least the reasons stated above with respect to claim 25. Further, claims 26-30 are each independently patentable because of the novel and nonobvious features of the combinations set forth in each claim.

Independent Claim 31

Keller Does Not Teach All the Elements of Independent Claim 31 As Arranged in the Claim

The Examiner rejects independent claim 31 as being anticipated under 35 U.S.C. § 102(b) by *Keller*. (Office action at pgs. 2-3.) As with claim 1, the Examiner suggests that "it is clear that *Keller* teaches using a processing system that includes the neural network, and it is clear that *Keller* teaches 360° image depth information 'data'; therefore, it is inherent that the neural network must 'inherent' [sic] include the two inputs for the image 'intensity,' and the range 'depth' to distinguish between skin and other features as explained in page 2." (Office action at pg. 3.) The Examiner's rejection is traversed.

As discussed below, *Keller* does not expressly or inherently teach each element of claim 31 arranged as required by the claim.

Independent claim 31 recites a method comprising:

> establishing a first data set corresponding to intensity of returned electromagnetic radiation from an object along a surface of the object and a second data set corresponding to depth along the surface; and
>
> adaptively processing the first data set and the second data set to identify a man-made object suspected to be one or more of contraband or a potential security threat.

Keller describes research and development efforts concerning a privacy algorithm that removes human features from images produced by a millimeter-wave surveillance system. (*Keller* at pg. 1). In the section of *Keller* relied on mainly by the Examiner, *Keller* reports results for edge and gradient detection algorithms applied to imagery. (*Keller* at pg. 2.) Figures 1(b) and 1(d) of *Keller* show the results of one edge detection algorithm.

There is no indication on page 2 of *Keller* that the processing performed involved "establishing a first data set corresponding to intensity of returned electromagnetic radiation from an object along a surface of the object <u>and</u> a second data set corresponding to depth along the surface; and adaptively processing the first data set <u>and</u> the second data set to identify a man-made object suspected to be one or more of contraband or a potential security threat." Specifically, there is no indication in *Keller* that "a first data set corresponding to intensity" <u>and</u> "a second data set corresponding to depth along the surface" are necessarily used in producing

the edge detection results shown in FIGS. 1(b) and 1(d). Instead, *Keller* is silent as to the specifics of the edge and gradient detection algorithms.

Furthermore, the Examiner has not provided any rationale or evidence tending to show "that the missing descriptive matter is necessarily present in the thing described in the reference" in order to establish inherency. MPEP 2112.IV (citing *in re Robertson*, 169 F.3d 743, 745, 49 USPQ2d, 19149, 1950-51 (Fed. Cir. 1999)). Instead, the Examiner appears to conclude (without any rationale or evidence) that: (1) the edge and gradient algorithm on page 2 uses depth data; and (2) because intensity data is created as part of producing the image data, the intensity data must also be an input to the edge and gradient algorithms discussed on page 2 "to distinguish between skin and other features." (Office action at pgs. 2-3).

However, the Examiner has not shown why the edge and gradient algorithms cannot use intensity information alone or depth information alone.

Furthermore, the neural networks referenced in *Keller* also do not indicate that they can "adaptively [process] the first data set [corresponding to intensity of returned electromagnetic radiation from an object along a surface of the object] and the second data set [corresponding to depth along the surface] to identify a man-made object suspected to be one or more of contraband or a potential security threat." In particular, the *Keller* article refers to three types or uses of neural networks: (1) a multi-layer perceptron artificial neural network (ANN) used to detect plastic textures; (2) a pulse coupled neural network (PCNN) used to detect any man-made objects; and (3) an artificial neural network trained on spatial frequencies to detect any man-made object. As more fully explained above with respect to claim 1, none of the neural networks (1) through (3) described in the *Keller* article, however, teaches or suggests using <u>both</u> a first data set corresponding to intensity of returned electromagnetic radiation from an object along a surface of the object <u>and</u> a second data set corresponding to depth along the surface to determine the presence of a man-made object.

In addition to not teaching all of the elements of claim 31, there is also no teaching in *Keller* of combining any of the neural networks with the methods on page 2 to form a single method arranged as in claim 31. Thus, *Keller* does not show the elements <u>as arranged in the claim</u> as required by MPEP 2131.

Accordingly, *Keller* fails to teach or suggest all the features of claim 31 as arranged in the claim. The Examiner's § 102(b) rejection of independent claim 31 should therefore be withdrawn and such action is respectfully requested.

<u>*Keller* Does Not Enable All the Elements of Independent Claim 31</u>

The sections in *Keller* relied on by the Examiner do not provide sufficient disclosure for one of ordinary skill in the art to practice the described methods. For example, with respect to the second neural network technique described, *Keller* provides no further implementation detail than that reproduced above and expressly states: "The initial implementation of the PCNN technique was not successful and additional development and understanding of the technique is required before it can be considered successful." With respect to the third neural network technique, *Keller* also provides no further implementation detail than that reproduced above and states: "This work is ongoing and has not been fully proven."

Accordingly, *Keller* is not an enabling disclosure for the techniques relied on by the Examiner. The Examiner's § 102(b) rejection of independent claim 31 should be withdrawn for this additional reason as well. *See Novo Nordisk Pharm. v. Bio-Technology General*, 424 F.3d 1347 (Fed. Cir. 2005) ("In order to anticipate, a prior art disclosure must also be enabling, such that one of ordinary skill in the art could practice the invention without undue experimentation.")

Conclusion

For the reasons recited above, the application is believed to be in condition for allowance and such action is respectfully requested. If any issues remain in light of these remarks and amendments, the Examiner is formally requested to contact the undersigned attorney to arrange a telephonic interview. This request is being submitted under MPEP § 713.01, which indicates that an interview may be arranged in advance by a written request.

Respectfully submitted,

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